

**Work Order ID 52459**

Friday, September 25, 2009 10:14:40 AM



Page 1

Item ID: D212-664-101TRN

Accept



Setup Start



Revision ID: C

Stop



Item Name: Crosstube Turning Detail

Start Date: 9/25/2009 Start Qty: 1.00



Cust Item ID:

Required Date: 10/12/2009 Req'd Qty: 1.00



Customer:

Reference:

Approvals:

Process Plan:

Date:

09-25

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run

Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr

Revision Nbr

D212-664-141

Rev C

100



Mori Seiki

MORI SEIKI CNC LATHE LARGE

0.00

Memo

0.00

Mori Seiki CNC Lathe Large

1-Fill tube with sand & install plugs DT8534 on both ends as per Folio FA113  
2-Turn first side as per Folio FA113  
3-File down transition lines smooth.

Q.n 09-09-29 ①

110



QC

QC1- Inspect dimensions to dimension sheet

0.00

Memo

0.00

Quality Control

Q.n 09-09-29 ①

120



Mori Seiki

MORI SEIKI CNC LATHE LARGE

0.00

Memo

0.00

Mori Seiki CNC Lathe Large

1-Turn second side as per Folio FA113  
2-File down transition lines smooth.  
3-Remove sand and plugs

Q.n 09-09-29 ①

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Page 2

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Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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130

QC1- Inspect dimensions to dimension sheet

0.00



QC

Memo

0.00

Quality Control

A.M. 09 - 09 - 29 ①

140

QC8- Inspect parts - second check

0.00



QC

Memo

0.00

Quality Control

① / - AWM 9-9-30

150

Crosstubes Chemical Conversion

0.00



HandFXtube

Memo

0.00

Hand Finishing Crosstubes

① / - AWM 9-9-30

**Work Order ID 52459**

Friday, September 25, 2009 10:14:40 AM



Page 3

Item ID: D212-664-101TRN

Accept



Setup Start



Revision ID: C

Stop



Item Name: Crosstube Turning Detail

Start Date: 9/25/2009 Start Qty: 1.00



Cust Item ID:

Required Date: 10/12/2009 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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160

QC3- Inspect Part Finish

0.00



QC

Memo

0.00

Quality Control

0.1 0.8 - 0.9 - 30.0

170

Packaging

0.00



Packaging

Memo

0.00

Packaging

Identify and Stock in kanban rack Location: X-TUBE CELL

1 2 - AWM 9-9-30

180

QC21- Final Inspection - Work Order Release

0.00



QC

Memo

0.00

Quality Control

09/10/01 HJ  
mf  
09-10-01

# Picklist Print

Friday, September 25, 2009 10:14:39 AM

Page 1  
1

Work Order ID: 52459



Parent Item: D212-664-101TRNRevC



Parent Item Name: Crosstube Turning Detail

Start Date: 9/25/2009

Required Date: 10/12/2009

Comments:

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Remaining Qty To Pick	Qty Issued	Date Issued	Status
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D6005-128RevA      Manufactured      No

120

Each

17.0000

1.0000



Q.m 09-09-29

Crosstube Material

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

LG

17

34686

1

34775

2

38337

14

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
1

<b>DART AEROSPACE LTD</b>		<b>Work Order:</b> 52459
<b>Description:</b> Crosstube Assembly (205/212/412 High Fwd)		<b>Part Number:</b> D212-664-141
<b>Inspection Dwg:</b> D212-664-141 Rev: C		<b>Page 1 of 1</b>

### FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

Inspection Sheet	Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	0.200	+/-0.010	0.200	/			
	R0.063	+/-0.010	R0.063	/			
	2.740	+0.005/-0.000	2.742	/			
	5.097	+/-0.030	5.097	/			
	2.304	+0.005/-0.000	2.309	/			
	2.340	+0.005/-0.000	2.345	/			
	2.398	+0.005/-0.000	2.403	/			
	2.448	+0.005/-0.000	2.452	/			
	2.498	+0.005/-0.000	2.501	/			
	2.549	+0.005/-0.000	2.553	/			
	2.599	+0.005/-0.000	2.604	/			
	2.671	+0.005/-0.000	2.676	/			
	2.701	+0.005/-0.000	2.706	/			
SIDE B	0.200	+/-0.010	0.200	/			
	R0.063	+/-0.010	<del>0.200</del> R0.063	/			
	2.740	+0.005/-0.000	<del>R0.063</del> 2.742	/			
	5.097	+/-0.030	<del>2.742</del> 5.097	/			
	2.304	+0.005/-0.000	<del>5.097</del> 2.309	/			
	2.340	+0.005/-0.000	<del>2.345</del> 2.345	/			
	2.398	+0.005/-0.000	<del>2.345</del> 2.403	/			
	2.448	+0.005/-0.000	<del>2.403</del> 2.452	/			
	2.498	+0.005/-0.000	<del>2.4</del> 2.503	/			
	2.549	+0.005/-0.000	2.553	/			
	2.599	+0.005/-0.000	2.604	/			
	2.671	+0.005/-0.000	2.676	/			
	2.701	+0.005/-0.000	2.706	/			
	126.51	+/-0.020	126.490	/			

<b>Measured by:</b> Q.m	<b>Audited by:</b> 9-9-30	<b>Prototype Approval:</b>	N/A
<b>Date:</b> 09-09-29	<b>Date:</b> AWM	<b>Date:</b>	N/A

Rev	Date	Change	Revised by	Approved
A	05.04.27	New Issue (P/O D412-664-101)	KJ/JLM	
B	06.03.15	Tolerance revised for 5.097 per Dwg Rev update	KJ/JLM	
C	07.05.28	Dwg Rev updated	KJ/JLM	



DESIGN <b>PH</b>	DRAWN BY <b>PH</b>	<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA	
CHECKED <b>QP</b>	APPROVED <b>[Signature]</b>	DRAWING NO. D212-664-141	REV. C SHEET 1 OF 3
DATE 07.03.08		TITLE XTUBE ASS'Y (205/212/412 HI FWD)	SCALE NTS
A	00.12.12	NEW ISSUE	
B	05.02.04	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	
C	07.03.08	REMOVE -851 ABRASION STRIP; ADD MAGNOBOND 6398, CUSHION, REVERSE CLAMPS	

RELEASED

07.04.24

DEO ATTACHED

Qty	Part Number	Description
X	D212-664-141	CROSSTUBE ASSEMBLY (205/212/412 HIGH FWD)
1	D6005-128	CROSSTUBE
2	D2893-1	SUPPORT
4	D3595-063-450	RUBBER CUSHION
4	MS21920-25	CLAMP (OR MS21920-26)
A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

#### GENERAL NOTES:

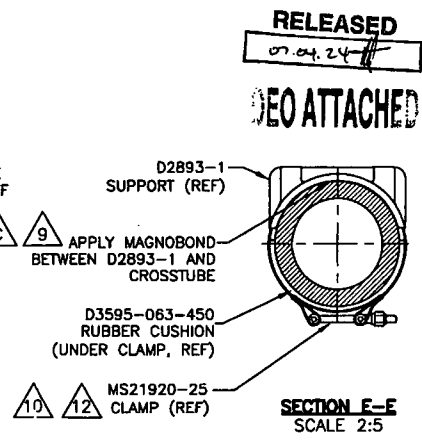
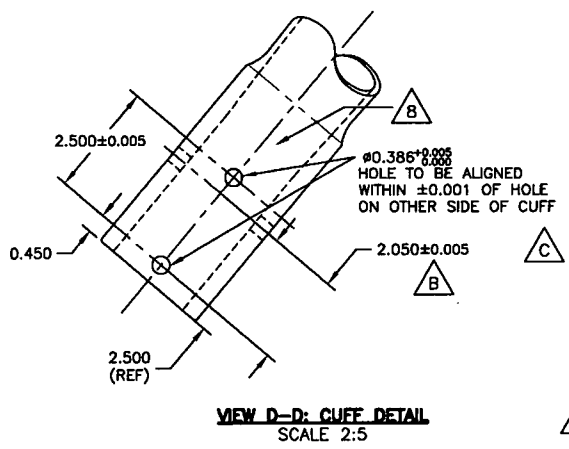
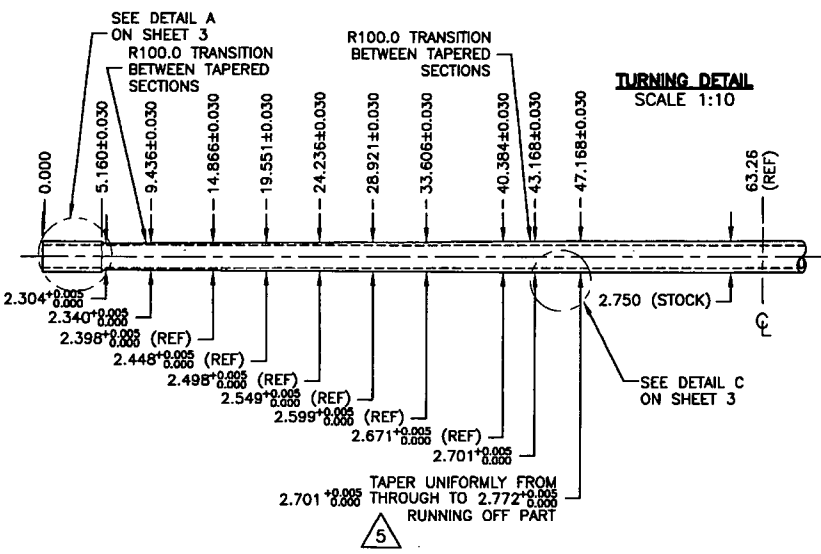
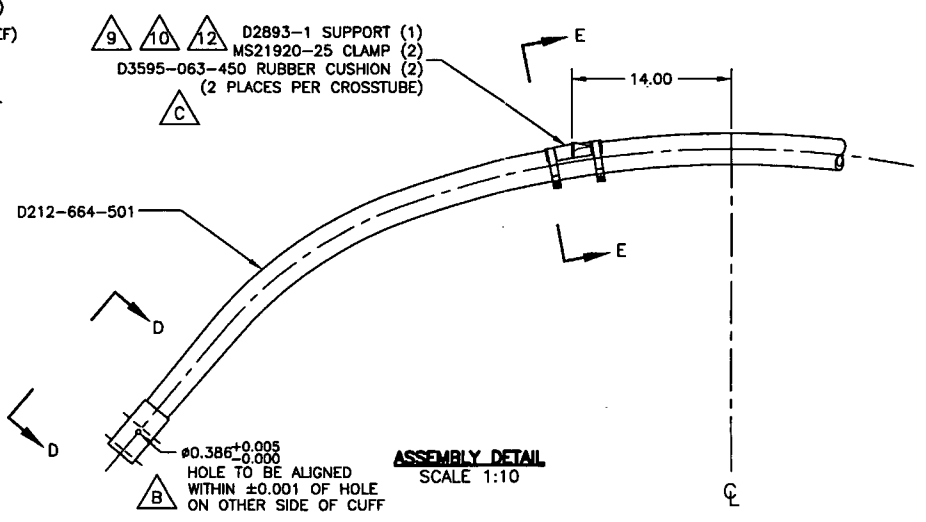
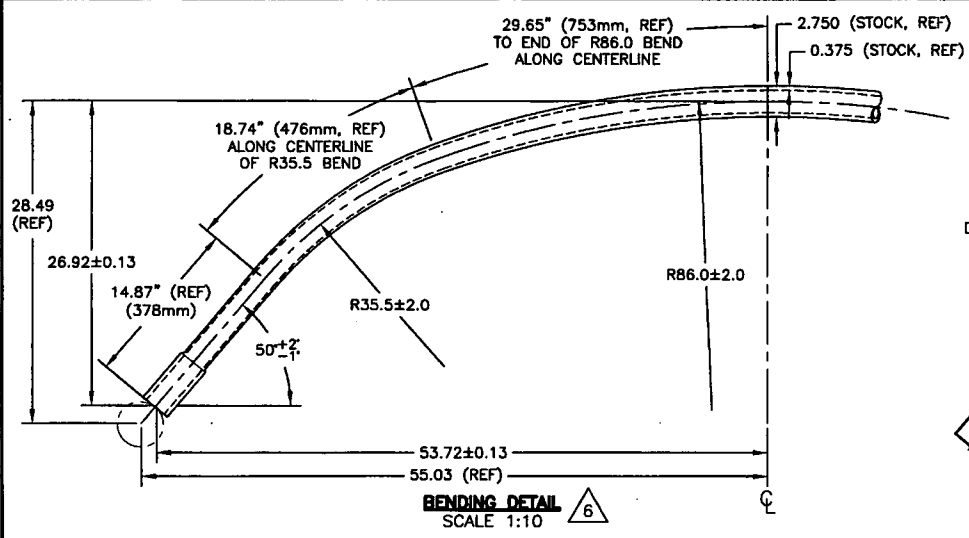
- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 2) MATERIAL: MANUFACTURED FROM D6005-128  
FINISHED LENGTH =  $126.51 \pm 0.020$
- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 4) PART IS SYMMETRIC ABOUT CENTERLINE.
- 5) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 6) BEND PROGRESSIVELY WITH A MINIMUM OF 3 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 7) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 8) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 9) INSTALL D2893-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 10) INSTALL MS21920-25 CLAMPS (OR -26) WITH D3595-063-450 RUBBER CUSHIONS TO SECURE THE D2893-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT
- 11) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 12) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

RETURN TO:  
ENGINEERING  
UNCONTROLLED CO  
SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. 52439

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W/O 52459

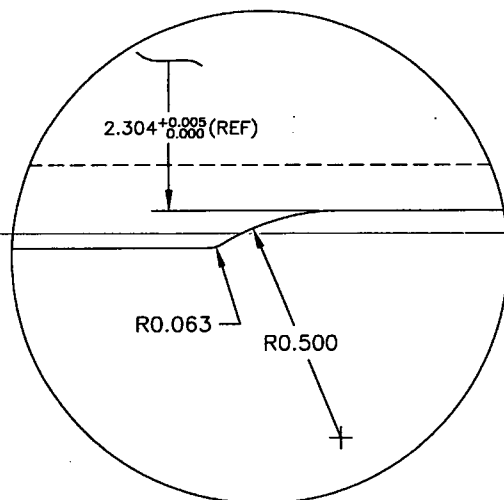
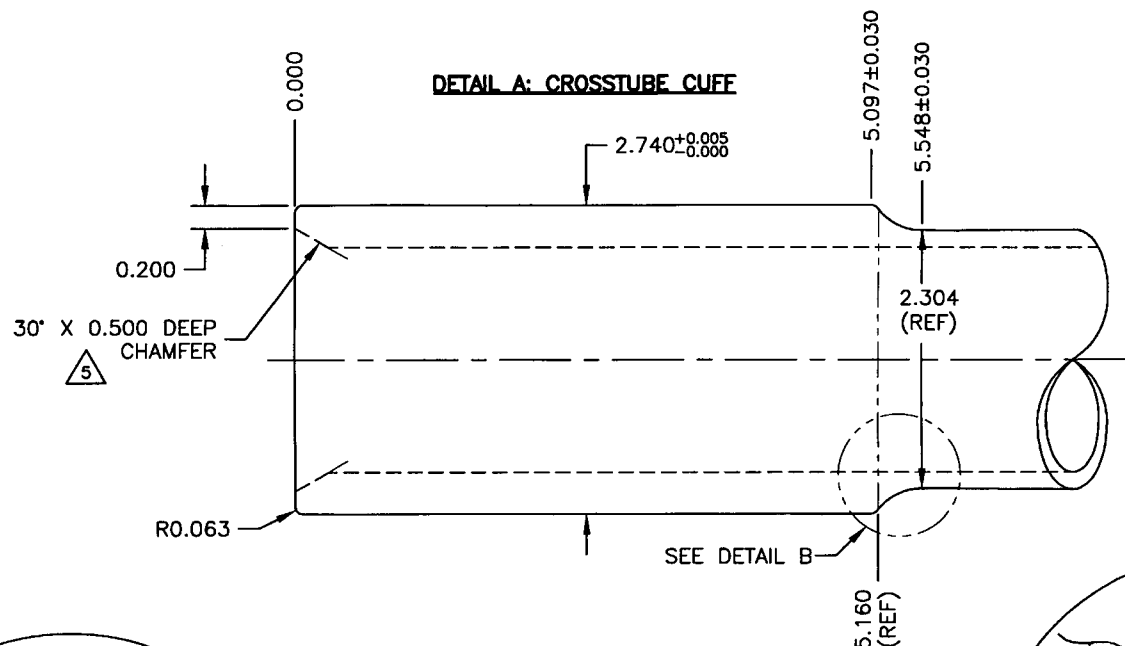


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		DATE	07.03.08			D212-664-141	SHEET 2 OF 3
				TITLE		SCALE	
				XTUBE ASS'Y (205/212/412 HI FWD)		1:10	

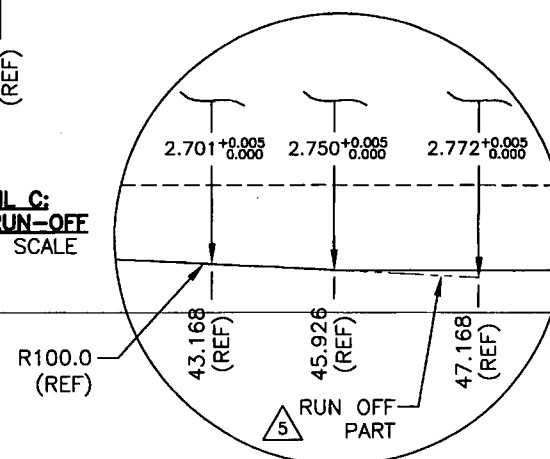
W/O 52459

RELEASED  
9.04.24 (P)  
PER ECN 887

DEO ATTACHED



**DETAIL C: TAPER RUN-OFF**  
NOT TO SCALE



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DATE 07.03.08		TITLE XTUBE ASS'Y (205/212/412 HI FWD)		
		REV. C SHEET 3 OF 3 SCALE 1:1		



DRAWING NO. D212-664-141	TITLE CROSSTUBE	REV. C	<b>DART AEROSPACE LTD ENGINEERING ORDER</b>	D.E.O. NO. D212-664-141-C-1	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>JP</i>	CHECKED <i>PS</i>	MFG. APPR. <i>EA</i>	APPROVED <i>WJD</i>	DE APPR. <i>WJD</i>		
DATE 09.05.01	DATE 09.06.15	DATE 09.06.15	DATE 09/08/16	DATE 09/06/16		

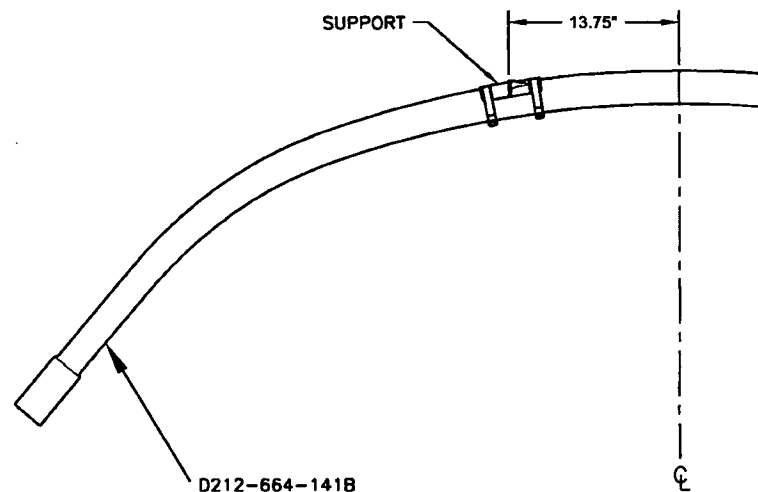
**CHANGE:**

ADD THE FOLLOWING CROSSTUBE ASSEMBLY:

Part Number	Description
D212-664-141B	CROSSTUBE ASSEMBLY (214 HIGH FWD)

THE D212-664-141B CROSSTUBE HAS THE SAME PARTS LIST AS THE D212-664-141 CROSSTUBE. HOWEVER, INSTALL THE SUPPORTS AS SHOWN IN FIGURE 1 OF THIS ENGINEERING ORDER. THE NEW KIT IS OTHERWISE ASSEMBLED PER THE D212-664-141 CROSSTUBE.

**RELEASED**  
*CM/06/12*



**FIGURE 1 - SUPPORT INSTALLATION**